SUMMARY

The invention provides a system for determining one or more state probabilities for one or more states in a trellis representation. In one embodiment of the system, branch metric logic determines branch metrics for one or more of the

5   branches between one or more states in a first portion of the trellis and one or more states in a second portion of the trellis, and state probability logic determines state probabilities for one or more of the states. In one embodiment, the system concurrently normalizes the one or more state probabilities responsive to assertion of a normalization control signal. In one implementation, the state probability logic

10   determines a state probability for a state by deriving branch values for one or more branches exiting or entering the state, and then derives the state probability by performing a group operation on the branch values. In one implementation example, the group operation is the MAX* operation.

In a second embodiment, the state probability logic comprises p state

15   probability logic modules for determining in parallel state probabilities for each of p states, where p is an integer of two or more. In one embodiment, the system concurrently normalizes the one or more state probabilities responsive to assertion of a normalization control signal.

The invention also provides a system for determining an estimate of or

20   extrinsic output for each of one or more bits. In one embodiment, the system iterates for each of the bits. In this embodiment, during a particular iteration, the system derives state values for each of one or more states in a trellis representation, where the state value for a state is derived from the forward state probability and the backward state probability for the state. Then, it derives a first value by performing a group

25   operation on the state values for each of the states which imply release of a logical "1" for the bit, and second value by performing a group operation on the state values for each of the states which imply release of a logical "0" for the bit. It then derives an estimate of or extrinsic output for the bit from the first and second values. In one implementation, the group operation is the MAX* operator. In one implementation

30   example, the system derives an estimate of the bit by subtracting the second value